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FIG. 1.

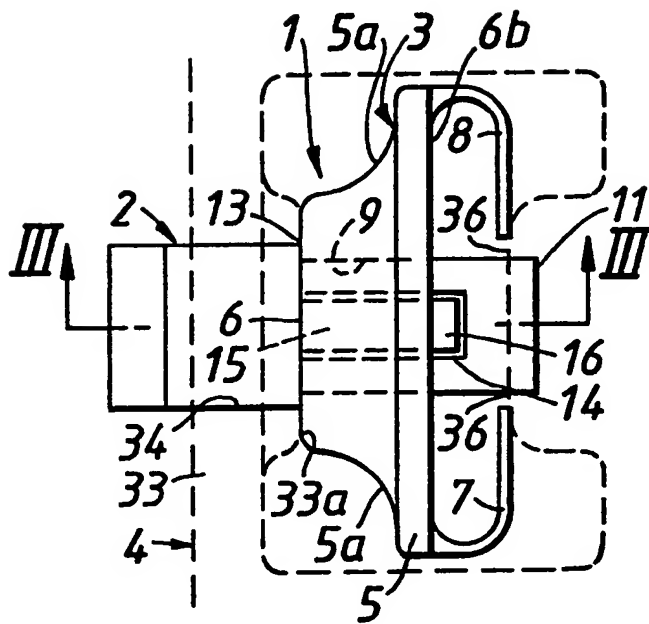


FIG. 3.

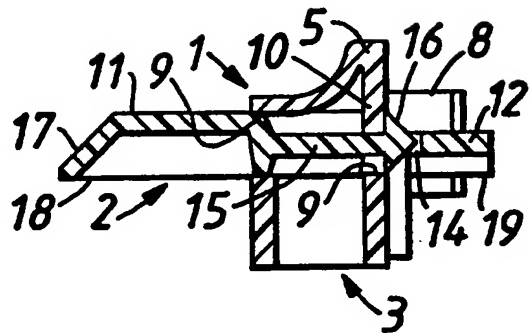


FIG. 2.

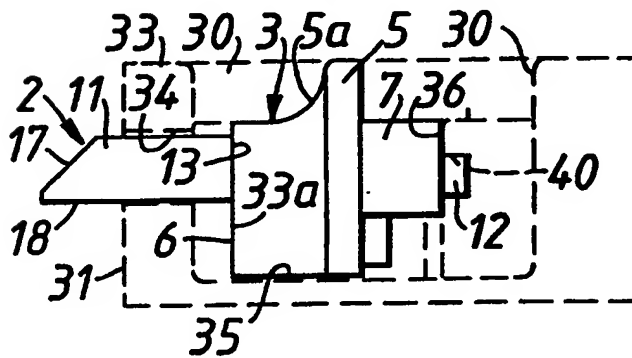
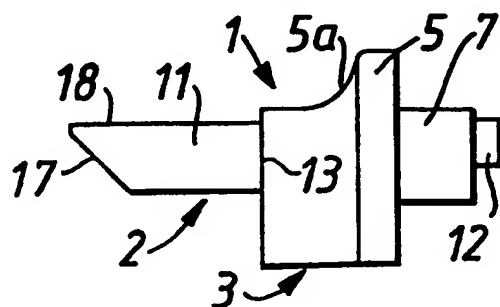


FIG. 4.



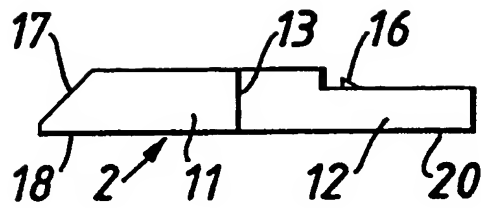


FIG. 5.

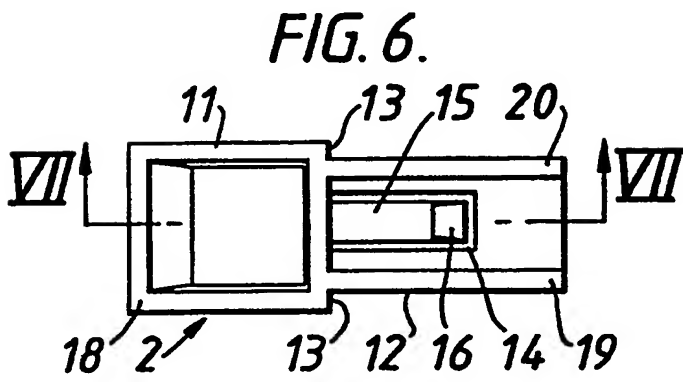


FIG. 6.

FIG. 6A.

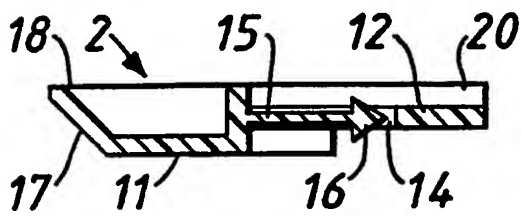
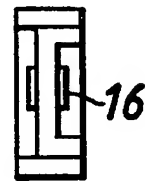


FIG. 7.

FIG. 8.

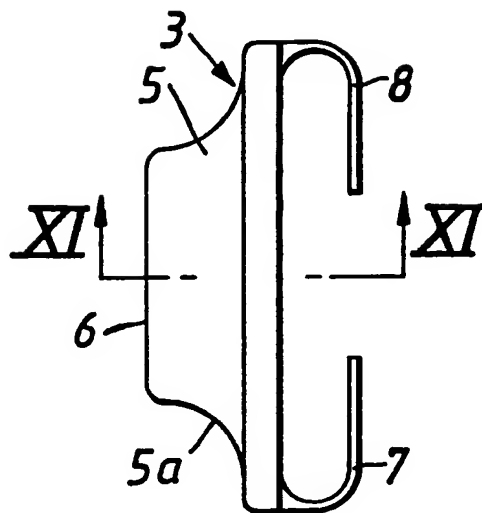


FIG. 9.

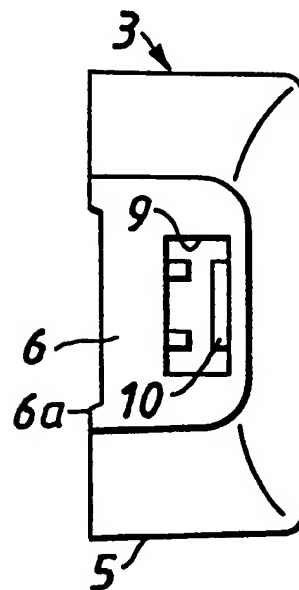


FIG. 10.

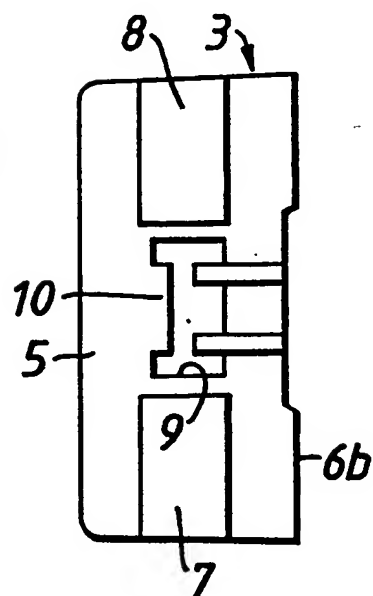
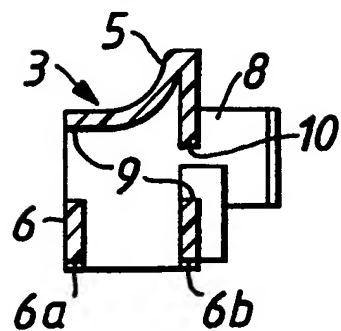


FIG. 11.



TITLE

"A latch assembly, the combination of such an assembly and a component to which it is fitted, and a method of assembling the latch assembly with the component"

TECHNICAL FIELD & BACKGROUND ART

The present invention relates to a latch assembly, the combination of such an assembly with a component to which it is fitted, and a method of assembling the latch assembly with the component.

Latch assemblies are well known for fastening or holding a component to which they are fitted relative to a further component, typically for fastening a door, panel or wall component relative to a frame or wall on which that component may be hingedly mounted. Usually such assemblies have a spring loaded latch member which is longitudinally displaceable against its spring biasing to move into engagement, possibly snap engagement, with a rebate to effect fastening and it is an object of the present invention to provide a latch assembly which is relatively simple in both structure and operation, lends itself to relatively inexpensive manufacture, preferably by use of plastics mouldings, and may easily and quickly be fitted to a component for latching thereof.

STATEMENTS OF INVENTION & ADVANTAGES

According to the present invention there is provided a latch assembly for fitting to a component and comprising a longitudinally extending latch member which is to be longitudinally slidable on said component for latching and a spring member which is to be retained in said component for biasing the latch member longitudinally in a latching sense; said spring member having a head part and a spring part and the latch member being engageable with the head part for longitudinal displacement in unison therewith so that such unified displacement will be responsive to biasing provided by the spring part reacting against the

component.

Further according to the present invention there is provided the combination of a latch assembly as specified in the immediately preceding paragraph and a component to which the assembly is fitted.

Still further according to the present invention there is provided a method of assembling a latch assembly as specified in the preceding penultimate paragraph with a component which comprises providing the component with a cavity which is to receive the spring member and has a wall part with an aperture therein through which the latch member is to project from the component for latching thereof; mounting the spring member in the cavity and inserting the latch member through said aperture to engage with the head part of the spring member for longitudinal displacement in unison therewith and so that the latch member can react against longitudinal biasing provided by a reaction of the spring part between the component and the head part.

By the present invention it is preferred that the latch assembly is a two part structure consisting of the latch member and spring member. It is also preferred that each of the latch and spring members is a one piece plastics moulding (particularly the spring member so that the resilience of the plastics can provide the biasing required of the spring part).

To facilitate fitting of the latch assembly it is preferred that the latch member will automatically engage with the head part of the spring member for longitudinal displacement in unison therewith. With this in mind at least one of the latch member and spring member may have snap engaging means by which those members are snap engageable together to provide the required unified displacement. By this latter technique it may be possible for the latch assembly to be fitted to the component

quickly, easily and without use of hand tools. The aforementioned snap engaging means conveniently comprises a resiliently mounted detent on the latch member. Again to facilitate assembly, the head part may have a seating such as a longitudinally extending recess or aperture within which the latch member is receivable longitudinally to engage with the head part. Where the latch member carries the resiliently mounted detent as aforementioned, this detent may be displaced as the latch member is moved longitudinally into the seating until the detent snap engages with the head part. The location of the latch member in the seating of the spring member conveniently serves to restrain the latch member from displacement laterally relative to the head part thereby providing stability in the assembly while permitting the required longitudinal displacement of the latch member. With the latch member in engagement with the head part, preferably the member is retained for the aforementioned unified displacement by surfaces which abut between the latch and spring members; for example, the relative displacement between the latch member and head part in one sense of longitudinal direction may be restrained by abutment of a shoulder on the latch member with the head part and in the opposite sense of longitudinal direction by abutting surfaces in the snap engaging means.

The latch member will usually have a chamfered tongue or bolt portion which will project from the component for latching purposes. Such a chamfer on the tongue or bolt is conventional for latch assemblies to facilitate engagement of the tongue or bolt with a rebate to effect fastening. An advantageous feature which the present invention can provide is that the latch member may be engageable with the spring member in one position or another position which is the reverse thereof so that the chamfer on the bolt portion of the latch member can,

optionally, be presented in either of two latching senses as may be required for the particular manner in which the component is to latch engage with another component.

The spring part is conveniently formed as one or more leaf springs which extend from the head part to react longitudinally between that part and a wall or face of the component within which the spring member is fitted. Such a leaf spring is convenient for plastics moulding and will usually be of a J or U shape. It will be appreciated that the spring part can take many shapes and forms provided that this part serves to bias the head part and latch member for unified displacement longitudinally in a direction for the latch member to project from the component to effect latching and to be displaceable against the spring biasing as the latch member moves into its latch engagement (and preferably to effect release of the latch engagement).

With the latch assembly fitted to the component to provide the combination previously specified, the spring biasing may be achieved by a reaction of the spring part between the head part and a side face of the cavity within which the spring part is mounted in the component while the latch member engaging with the head part extends therefrom through a wall of the cavity to project from the component. Usually the latch member will project through an aperture in the wall of the cavity; preferably this aperture is substantially complementary in size to the latch member so that the latter is longitudinally slidable and closely received in the aperture and the latch assembly is restrained, by its engagement with the aperture in the wall, against lateral displacement relative to the component. Desirably the latch assembly is retained in the cavity of the component by the location of one longitudinal end of the latch member (that is the end adjacent to the previously mentioned tongue or bolt

portion) within the aperture of the cavity wall as aforementioned and the other longitudinal end part of the latch member within a recess that extends from the cavity to permit the required longitudinal displacement of the latch member and additionally restrain that member from lateral displacement relative to the component.

Preferably the head part of the spring member is accessible in the component to which it is fitted for that head part to be manually displaced longitudinally (together with the latch member) against the biasing of the spring part for the purpose of withdrawing the latch member towards or into the component to release the latch.

Preferably the cavity of the component which receives the spring member is formed by a plastics moulding that includes the wall and aperture through which the latch member projects from the component; such a plastics moulding may be secured to the component or be integral therewith, for example where the component is itself a plastics moulded wall, panel, door or frame. While reference is made to the novelty of the latch assembly in a "cavity" of the component, it is to be realised that the cavity does not necessarily have to fully enclose the periphery of the spring member and may, for example, merely comprise longitudinally opposed walls between which the spring member is received and reacts.

DRAWINGS

One embodiment of a latch assembly, such an assembly when fitted to a component and a method of assembling the assembly and component, all in accordance with the present invention, will now be described, by way of example only, with reference to the accompanying illustrative drawings, in which:-

Figure 1 is a plan view of the latch assembly fitted in the cavity of a panel component;

Figure 2 is a side view of the assembly shown in

Figure 1;

Figure 3 is a section of the latch assembly (with the panel component omitted) taken on the line III-III of Figure 1;

Figure 4 is a side view of the latch assembly (with the panel component omitted) similar to that shown in Figure 2 but with the latch member reversed for latch engagement in an opposite sense to that shown in the arrangement of Figure 2;

Figure 5 is a side view of the latch member of the assembly in Figure 1;

Figures 6 and 6A are a plan view and end view respectively of the latch member;

Figure 7 is a section of the latch member taken on the line VII-VII of Figure 6;

Figures 8, 9 and 10 are respectively a plan view, one end view and the opposite end view of the spring member in the latch assembly of Figure 1, and

Figure 11 is a section of the spring member taken on the line XI-XI of Figure 8.

DETAILED DESCRIPTION OF DRAWINGS

The latch assembly 1 of the illustrated embodiment consists of a plastics moulded latch member 2 and a plastics moulded spring member 3. In Figures 1 and 2 this latch assembly is shown fitted in combination with a plastics moulded panel component 4 (for convenience of illustration this has been shown by broken lines) which, typically, may be a hinged wall or door of a plastics container that is to be releasably fastened by the latch assembly to a frame or further wall of the container.

The spring member 3 (see Figures 9 to 11) has a hollow head part 5 having longitudinally opposed side walls 6a and 6b. The side wall 6a has a substantially flat external face 6. Extending from the other side wall 6b is a spring part formed by two leaf springs 7 and 8 of substantially J

shape. It will be seen from Figure 8 that the legs of the leaf springs 7 and 8 lie in a plane substantially parallel to and longitudinally spaced from the plane of the face 6. Extending longitudinally through the opposed walls 6a and 6b of the head part 5 is a seating in the form of substantially rectangular apertures 9 in those walls. The end of the seating 9 remote from the face 6 is constricted in the side wall 6b by a laterally extending lip or flange 10 on the head part.

The latch member 2 (Figures 5 to 7) has a generally rectangularly sectioned, hollow, bolt portion 11 extending longitudinally from which is a shank portion 12. The shank portion 12 extends from the head portion 11 to form internal shoulders 13 on the head portion. Located within a longitudinally extending slot 14 in the shank portion 12 is a cantilevered leaf spring 15 which extends from the head portion 11 and at its free end has a barb or detent 16. The leaf spring 15 is moulded to lie substantially in the plane of the shank portion 12 with the detent 16 projecting laterally from opposite sides of the shank portion as shown in Figure 7. The bolt portion 11 has its end remote from the shank portion chamfered at 17 to converge with a substantially flat longitudinally extending abutment face 18 of the bolt portion. The shank portion is provided with two laterally spaced, longitudinally extending strengthening ribs 19 and 20.

The shank portion 12 has a lateral section which is substantially complementary to the aperture provided by the seating 9 in the spring member 3 so that the shank portion of the latch member can be inserted longitudinally as a close sliding fit into the seating 9 through the end thereof in the face 6. During such insertion and immediately prior to the shoulders 13 of the bolt portion abutting the face 6, one side of the detent 16 abuts the flange 10 of the spring member head part 5. Continued

insertion of the latch member into the head part causes the chamfered face of the detent 16 to slide over the flange 10 (as the leaf spring 15 is laterally displaced) until the detent 16 snap engages, under the biasing effect of the leaf spring 15, over the flange 10. In this latter condition the shoulders 13 are substantially in abutment with the face 6 of the head part 5. Following the aforementioned snap engagement it will be appreciated that the latch member 2 is restrained from longitudinal displacement relative to the spring member 3, in one sense of longitudinal direction by abutment of the shoulders 13 with the end face 6 and in the opposite sense of longitudinal direction by abutment of the detent 16 with the flange 10 (see Figure 3).

To provide the combination in which the latch assembly 1 is fitted to the panel component 4 as shown in Figures 1 and 2, the panel component is provided with a cavity 30 (which is conveniently moulded therein) adjacent to an edge 31 of the panel. The panel has a wall 33 formed between its edge 31 and the cavity 30. Extending longitudinally through the wall 33 between the cavity and the edge 31 is a rectangular aperture 34 which is substantially complementary in lateral section to that of the bolt portion 11.

To assemble the combination as aforementioned, the spring member 3 is located in the recess 30 in abutment with a bottom face 35 thereof. In such location the face 6 abuts a flat face 33a on a boss projecting from the wall while the free ends of the legs of the leaf springs 7 and 8 abut a face 36 of the cavity 30 which face 36 longitudinally opposes the face 33a of the boss on the wall 33. With the spring member positioned in the cavity as aforementioned, the seating 9 coincides, substantially, with the aperture 34 in the wall 33. The leaf springs 7 and 8 may be pre-stressed during fitting of the spring member in the cavity

to bias the head part 3 longitudinally for its face 6 to abut the wall face 33a.

To complete the assembly, the latch member 2 with its shank portion 12 leading, is inserted through the aperture 34 in the wall of the panel 4 to be received longitudinally in the seating 9 of the head part 5. The latch member is pressed into the head part of the spring member 3 until its detent 16 snap engages with the flange 10 as previously explained so that the latch member and head part of the spring member 3 are displaceable longitudinally in unison. From Figures 1 and 2 it will be seen that if the latch member 2 and head part 5 are longitudinally displaced rightwardly in the Figure to withdraw the bolt portion 11 into the wall component 4, the leaf springs 7 and 8 will be stressed by their reaction between the head part 5 and the face 36 of the cavity 30 to resist the aforementioned longitudinal displacement and bias the bolt portion 11 outwardly of the wall component. Accordingly, when the wall component 4 is to be latch engaged in conventional manner with a rebate on an adjacent frame or other component (not shown), the chamfered surface 17 of the latch member can abut that frame to displace the latch member and head part longitudinally against the spring biasing for the bolt portion 11 to snap engage with the rebate. The flat face 18 of the bolt portion will usually abut a face of the rebate for fastening the wall component 4 and frame together. To release the latch engagement it is merely necessary to displace the latch member and head part 3 manually against the biasing of the leaf springs to withdraw the bolt portion 11 into the wall component 4. To facilitate such withdrawal the side of the head part 5 adjacent to the bolt portion 11 is provided with a smoothly flared profile 5a for manual engagement by fingers of an operative within the cavity 30.

During its longitudinal displacement the head part 5

of the spring member 3 will slide over the bottom face 35 of the cavity. The assembly of the latch member 2 with the spring member 3 is retained in the cavity by the close sliding engagement of the latch member 2 with the aperture 34 in the wall 33 (such engagement substantially restraining the latch assembly from lateral movement relative to the wall component). The free end of the shank portion 12 of the latch member can be located within a recess 40 (see Figure 2) which extends longitudinally from the cavity 30. The aforementioned free end of the shank portion 12 may be received within the recess 40 during assembly of the latch and spring members with the wall component so that the shank portion is longitudinally slidable within the recess 40 during engagement and disengagement of the latch. Abutment of the free end of the shank portion 12 with one or more laterally directed faces of the recess 40 can serve to additionally retain the latch assembly in the cavity and to restrain it from lateral displacement relative to the panel 4.

An advantageous feature provided by the structure of the latch member 2 and spring member 3 is that these members can be assembled to provide latching in either of two senses. This can be appreciated by comparison between the assemblies in Figures 3 and 4. In Figure 4 the latch member 2 is shown in engagement with the head part 5 of the spring member 3 in a reverse position as compared with that shown in Figure 3 (in particular, in Figure 4 the chamfer 17 is directed downwardly while in Figure 3 it is directed upwardly). In the aforementioned reverse position of the latch member the detent 16 snap engages with the flange 10 in a similar manner to that previously described and indeed the latch assembly will operate in substantially the same manner as that previously discussed although latch engagement in the Figure 4 arrangement will be effected in a reverse sense from that of the Figure 3 arrangement.

CLAIMS

1. A latch assembly for fitting to a component and comprising a longitudinally extending latch member which is to be longitudinally slidable on said component for latching and a spring member which is to be retained in said component for biasing the latch member longitudinally in a latching sense; said spring member having a head part and a spring part and the latch member being engageable with the head part for longitudinal displacement in unison therewith so that such unified displacement will be responsive to biasing provided by the spring part reacting against the component.
2. An assembly as claimed in claim 1 in which each of the latch member and spring member is a one piece plastics moulding.
3. An assembly as claimed in either claim 1 or claim 2 in which at least one of the latch member and spring member has snap engaging means by which those members are snap engageable to provide said unified displacement.
4. An assembly as claimed in claim 3 in which the snap engaging means comprises a resiliently mounted detent on the latch member which snap engages with the head part.
5. An assembly as claimed in any one of the preceding claims in which the head part has a seating by which the latch member is receivable longitudinally to engage for said unified longitudinal displacement.
6. An assembly as claimed in claim 5 in which the seating comprises an aperture in the head part within which the latch member is received longitudinally.
7. An assembly as claimed in either claim 5 or claim 6 in which the engagement of the head part with the latch member in said seating restrains the latch member from displacement laterally relative to the head part.
8. An assembly as claimed in any one of claims 5 to 7 when appendant to claim 3 in which the latch member is snap

engageable with the head part as the latch member is received longitudinally by the seating.

9. An assembly as claimed in any one of the preceding claims in which the latch member is engageable with the head part to be retained for said unified displacement by surfaces which abut between the two members.

10. An assembly as claimed in claim 9 when appendant to claim 3 in which relative displacement between the latch member and head part in one sense of longitudinal direction is restrained by abutment of a shoulder on the latch member with the head part and in the opposite sense of longitudinal direction is restrained by said snap engaging means.

11. An assembly as claimed in any one of the preceding claims in which the latch member has a tongue or bolt portion which is intended to project from the component for latching purposes and which has a chamfer to facilitate latching engagement, and wherein the latch member is engageable with the spring member in one position or another position which is the reverse thereof so that the chamfer can, optionally, be presented in either of two latching senses.

12. An assembly as claimed in any one of the preceding claims in which the spring part comprises at least one leaf spring extending from said head part.

13. An assembly as claimed in claim 12 in which said leaf spring is of substantially "J" or "U" shape for a leg thereof to abut the component and provide said biasing during longitudinal displacement between the head part and the component.

14. A latch assembly substantially as herein described with reference to the accompanying illustrative drawings.

15. The combination of a latch assembly as claimed in any one of the preceding claims and a component to which the assembly is fitted.

16. The combination as claimed in claim 15 in which the spring member is mounted within a cavity of the component for its head part to be displaceable longitudinally against biasing provided by a reaction of the spring part between the head part and a side face of the cavity and wherein the latch member in engagement with the head part extends longitudinally therefrom through a wall of the cavity to project from the component for latching engagement.
17. The combination as claimed in claim 16 in which the latch member extends through an aperture in the wall of the cavity which aperture is substantially complementary to the latch member so that the latter is longitudinally slidable and closely received therein.
18. The combination as claimed in claim 16 or claim 17 in which the extension of the latch member through the wall of the cavity restrains the latch assembly from lateral displacement relative to the component.
19. The combination as claimed in any one of claims 16 to 18 in which an end of the latch member which is longitudinally remote from that end which projects from the component is located within a recess which extends from the cavity and permits the required longitudinal displacement of the latch member, said recess restraining or additionally restraining the latch assembly from lateral displacement relative to the component.
20. The combination as claimed in any one of claims 15 to 19 in which the cavity is formed by a plastics moulding secured to or integral with the component.
21. The combination of a latch assembly and a component to which the assembly is fitted substantially as herein described with reference to the accompanying illustrative drawings.
22. A method of assembling a latch assembly as claimed in any one of claims 1 to 14 with a component which comprises providing the component with a cavity which is to receive

- the spring member and has a wall part with an aperture therein through which the latch member is to project from the component for latching engagement; mounting the spring member in the cavity and inserting the latch member through said aperture to engage with the head part of the spring member for longitudinal displacement in unison therewith and so that the latch member can react against longitudinal biasing provided by a reaction of the spring part between the component and the head part.

23. A method of assembling a latch assembly and a component substantially as herein described.

Amendments to the claims have been filed as follows

1. A latch assembly for fitting to a component and comprising a longitudinally extending latch member which is to be longitudinally slidable on said component and has a tongue or bolt portion which is intended to project from the component for latching purposes, said tongue or bolt having a chamfered face to facilitate latching engagement; a spring member which is to be retained in said component for biasing the latch member longitudinally in a latching sense and which has a head part and a spring part, and wherein said latch member is snap engageable with said head part for longitudinal displacement in unison therewith under or against longitudinal biasing provided by the spring part with the latch member in either one position or another position which is the reverse thereof so that the chamfered face of the tongue or bolt can, optionally, be presented in either of two latching senses.
2. An assembly as claimed in claim 1 in which each of the latch member and spring member is a one piece plastics moulding.
3. An assembly as claimed in either claim 1 or claim 2 in which the latch member has a resiliently mounted detent which snap engages with the head part.
4. An assembly as claimed in any one of the preceding claims in which the head part has a seating by which the latch member is receivable longitudinally to snap engage for said unified longitudinal displacement.
5. An assembly as claimed in claim 4 in which the seating comprises an aperture in the head part within which the latch member is received longitudinally.
6. An assembly as claimed in either claim 4 or claim 5 in which the engagement of the head part with the latch member in said seating restrains the latch member from displacement laterally relative to the head part.
7. An assembly as claimed in any one of the preceding

claims in which the latch member is engageable with the head part to be retained for said unified displacement by surfaces which abut between the two members.

8. An assembly as claimed in any one of the preceding
5 claims in which the spring part comprises at least one leaf spring extending from said head part.

9. An assembly as claimed in claim 8 in which said leaf spring is of substantially "J" or "U" shape for a leg thereof to abut the component and provide said biasing
10 during longitudinal displacement between the head part and the component.

10. A latch assembly substantially as herein described with reference to the accompanying illustrative drawings.

11. The combination of a latch assembly as claimed in any
15 one of the claims 1 to 9 and a component to which the assembly is fitted.

12. The combination as claimed in claim 11 in which the spring member is mounted within a cavity of the component for its head part to be displaceable longitudinally against
20 biasing provided by a reaction of the spring part between the head part and a side face of the cavity and wherein the latch member in engagement with the head part has its tongue or bolt portion extending longitudinally through a wall of the cavity to project from the component for
25 latching engagement.

13. The combination as claimed in claim 12 in which the latch member extends through an aperture in the wall of the cavity which aperture is substantially complementary to the latch member so that the latter is longitudinally slidable
30 and closely received therein.

14. The combination as claimed in either claim 12 or claim 13 in which the extension of the latch member through the wall of the cavity restrains the latch assembly from lateral displacement relative to the component.

35 15. The combination as claimed in any one of claims 12 to

14 in which an end of the latch member which is longitudinally remote from its tongue or bolt portion is located within a recess which extends from the cavity and permits the required longitudinal displacement of the latch member, said recess restraining or additionally restraining the latch assembly from lateral displacement relative to the component.

16. The combination as claimed in any one of claims 12 to 15 in which the cavity is formed by a plastics moulding secured to or integral with the component.

17. The combination of a latch assembly and a component to which the assembly is fitted substantially as herein described with reference to the accompanying illustrative drawings.

18. A method of assembling a latch assembly as claimed in any one of claims 1 to 9 with a component which comprises providing the component with a cavity which is to receive the spring member and has a wall part with an aperture therein through which the latch member is to project from the component for latching engagement; mounting the spring member in the cavity and inserting the latch member through said aperture to snap engage with the head part of the spring member for longitudinal displacement in unison therewith and so that the latch member can react against longitudinal biasing provided by a reaction of the spring part between the component and the head part.

19. A method of assembling a latch assembly and a component substantially as herein described.